APPENDIX B

Poster Abstracts

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NEUROTENSIN AND FOS IMMUNOREACTIVITIES IDENTIFY SUBPOPULATIONS OF STRIATOPALLIDAL NEURONS THAT RESPOND DIFFERENTLY TO DOPAMINE DEPLETION AND D_2 RECEPTOR BLOCKADE Judith S. Brog and D.S. Zahm Dept. of Anat. & Neurobiol., St. Louis Univ. Sch. Med., St. Louis, MO 63104

In the absence of measures used to enhance perikaryal neurotensin (NT) immunoreactivity (IR), few, if any, NT cell bodies can be observed in either the dorsal or ventral striatal regions in the rat. These structures display numerous stained perikarya following colchicine pretreatment. However, recent studies indicate that NT-IR striatal cells are revealed in rats following dopamine D_2 receptor blockade or reduction of dopaminergic neurotransmission (Zahm, Neurosci. 46: 335-350, 1992). It has also been recently reported that Fos, the protein encoded by the c-fos gene, is elevated in the striatum of rats given D_2 antagonists, and that these Fos-IR neurons project to the globus pallidus and contain message for enkephalin (Robertson et al., Neurosci. 49: 285-296, 1992). Recent double-labeling studies from our laboratory indicate that the NT-IR neurons are not the same neurons that express Fos following D_2 receptor blockade or reduction of striatal dopamine (Senger et al., in preparation). The current studies addressed whether the Fos-IR and/or NT-IR neurons observed acutely following midbrain 6-hydroxydopamine (6-OHDA) lesions project to the globus pallidus. Striatopallidal neurons were retrogradely labeled following iontophoretic injections of Fluoro-Gold (FG) into the globus pallidus. Dual-color immunoperoxidase detection of FG and Fos and fluorescence detection of FG combined with immunofluorescence for NT were used to locate double-labeled cells three days following 6-OHDA lesions. The results indicate that although the neuronal populations exhibiting NT-IR and Fos-IR are largely separate following 6-OHDA, a significant proportion of the former and the majority of the latter project to the globus pallidus. Identical results were obtained if the rats were given haloperidol. In contrast, neurons retrogradely labeled from the reticular part of the substantial nigra never exhibited NT-IR or Fos-IR following haloperidol. Likewise, Fos and NT were never co-localized in parvalbumin-IR interneurons. These results are consistent with at least two populations of striatopallidal neurons that respond differently to dopamine depletion and D_2 receptor blockade. Supported by NIH NS-23805, T32 NS-07254 and a grant from the United Parkinson's Foundation (Chicago).

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